

WHAT IS CLAIMED IS:

1. A method for determining the general semantic theme of a group of images, said method comprising the steps of:
 - (a) providing a plurality of digitized images, whereby each digitized image is identified as belonging to a specific group of images;
 - (b) extracting one or more image feature measurements from each of the digitized images in an image group;
 - (c) using the one or more image feature measurements to produce an individual image confidence measure that an individual image belongs to one or more semantic classifications, said individual image confidence measure produced for a plurality of the digitized images in an image group;
 - (d) using the individual image confidence measures for the images in the image group to produce an image group confidence measure that the image group belongs to one or more semantic classifications; and
 - (e) using the image group confidence measure to decide whether the image group belongs to a selected one or to none of the semantic classifications, whereby the selected semantic classification constitutes the general semantic theme of the group of images.
2. The method as claimed in claim 1 wherein step (a) comprises the step of identifying the specific image group by relating the images to a roll of film from which the digitized images were obtained, to a time or date of image capture, to a time or date the images were provided into step (a), or to the occurrence of a roll change in a film from which the digitized images were obtained.
3. The method as claimed in claim 1 wherein the image features extracted in step (b) include at least one feature selected from the group

10042605 "010600"

consisting of a face, a standing person, a gender or age characteristic of a person, a color histogram, a texture measure, and image spectral information.

4. The method as claimed in claim 1 wherein a support vector machine is used in the production of the individual image confidence measure in step (c).

5. The method as claimed in claim 1 wherein a support vector machine is used in the production of the image group confidence measure in step (d).

6. The method as claimed in claim 1 wherein step (d) comprises processing a plurality of image group confidence measures relating to an image group and making a mutually exclusive decision that the image group belongs to a specific one or to none of the semantic classifications.

7. A method for generation of themed imaging services based on the determination of the general semantic theme of a group of images according to the method of claim 1, said method comprising the steps of:

(a) providing a plurality of semantic theme processors, one for each semantic classification, to produce enhanced value imaging services and products for image groups that fall into an appropriate semantic theme;

(b) using the selected semantic classification to determine which of the semantic theme processors to apply to the group of images; and

(c) applying the selected semantic theme processor to the group of images to generate themed imaging services appropriate for the selected semantic classification.

8. The method as in claim 7 wherein the plurality of semantic theme processors include at least one semantic theme processor selected from the

group consisting of a wedding group processor, a baby group processor, a birthday party group processor, and an undersea group processor.

9. The method as claimed in claim 7 in which the semantic theme processor is a wedding group processor and the method further comprises the step of identifying image locations associated with a bride and groom.

10. The method as claimed in claim 7 in which the semantic theme processor is a baby group processor and the method further comprises the step of identifying image locations associated with a baby.

11. The method as claimed in claim 10 wherein the baby group processor identifies the gender of the baby.

12. The method as claimed in claim 7 in which the semantic theme processor is a birthday group processor and the method further comprises the step of identifying image locations associated with a birthday person.

13. The method as in claim 7 in which the semantic theme processor is a wedding group processor and the wedding group processor includes at least one processor selected from the group consisting of a compositing processor to autonomously create pleasing composite images of a bride and a groom or wedding party members, a vignetting processor to autonomously create pleasing vignette images of the bride and groom individually or together, an album processor to autonomously create pleasing photo albums of wedding images, and a motion image processor to autonomously create pleasing motion images of the bride and groom.

14. The method as in claim 7 in which the semantic theme processor is a baby group processor and the baby group processor includes at least

20160701 09:24:00

one processor selected from the group consisting of a vignetting processor to autonomously create pleasing vignette images from suitable baby pictures, an album processor to autonomously create pleasing photo albums of baby images, an album processor to autonomously create pleasing photo albums of baby images in which the gender of the baby is automatically determined from image content and the album has gender-specific artwork, and a motion image processor to autonomously create pleasing motion images from baby pictures.

15. The method as in claim 7 in which the semantic theme processor is a birthday group processor and the birthday group processor includes at least one vignetting processor to autonomously create pleasing vignette images from suitable birthday person pictures, an album processor to autonomously create pleasing photo albums of birthday images, and a motion image processor to autonomously create pleasing motion images from birthday pictures.

16. The method as in claim 7 in which the semantic theme processor is an undersea group processor and the undersea group processor includes a processor to autonomously create images optimally rendered so as to produce more vivid colors.

17. A computer storage medium having instructions stored therein for causing a computer to perform the method of claim 1.

18. A computer storage medium having instructions stored therein for causing a computer to perform the method of claim 7.

19. A method for determining the location of standing persons in a digitized image, said method comprising the steps of:

(a) providing a plurality of digitized images;

(b) extracting one or more facial feature measurements from at least one of the digitized images;

(c) using the facial feature measurements to estimate the scale of one or more faces that may appear in the image;

(d) using the estimated scale of the faces to estimate an expected body size and location for each of the faces; and

(e) applying a classifier to the estimated body sizes to verify one or more standing persons in the image.

20. The method as claimed in claim 19 wherein step (e) of applying the classifier comprises the steps of;

applying a wavelet decomposition technique to the area of the expected body size to obtain a plurality of wavelet coefficients; and

using a support vector machine to verify the presence of one or more standing persons from the wavelet coefficients.

21. A system for determining the general semantic theme of a group of digitized images, whereby each digitized image is identified as belonging to a specific group of images, said system comprising:

(a) an image feature extractor that extracts one or more image feature measurements from each of the digitized images in an image group;

(b) an image semantic classifier that uses the one or more image feature measurements to produce an individual image confidence measure that an individual image belongs to one or more semantic classifications, whereby said image semantic classifier produces the individual image confidence measures for a plurality of the digitized images in an image group;

(c) an image group semantic classifier that uses the individual image confidence measures for the images in the image group to produce an image group confidence measure that the image group belongs to one or more semantic classifications; and

(d) a decision module that uses the image group confidence measure to decide whether the image group belongs to a selected one or to none of the semantic classifications, whereby the selected semantic classification constitutes the general semantic theme of the group of images.

22. The system as claimed in claim 21 wherein the image feature extractor extracts at least one feature selected from the group consisting of a face, a standing person, a gender or age characteristic of a person, a color histogram, a texture measure, and image spectral information.

23. The system as claimed in claim 21 wherein the image semantic classifier uses a support vector machine in the production of the individual image confidence measure.

24. The system as claimed in claim 21 wherein the image group semantic classifier uses a support vector machine in the production of the image group confidence measure.

25. The system as claimed in claim 21 wherein the decision module processes a plurality of image group confidence measures relating to an image group and makes a mutually exclusive decision that the image group belongs to a specific one or to none of the semantic classifications.

26. A system for generation of themed imaging services based on the general semantic theme of a group of images, whereby each digitized image is identified as belonging to a specific group of images, said system comprising:

(a) an image feature extractor that extracts one or more image feature measurements from each of the digitized images in an image group;

(b) an image semantic classifier that uses the one or more image feature measurements to produce an individual image confidence measure that an individual image belongs to one or more semantic classifications, whereby said image semantic classifier produces the individual image confidence measures for a plurality of the digitized images in an image group;

(c) an image group semantic classifier that uses the individual image confidence measures for the images in the image group to produce an image group confidence measure that the image group belongs to one or more semantic classifications;

(d) a decision module that uses the image group confidence measure to decide whether the image group belongs to one or to none of the semantic classifications, whereby the selected semantic classification constitutes the general semantic theme of the group of images; and

(e) a plurality of semantic theme processors, one for each semantic classification, to produce enhanced value imaging services and products for image groups that fall into an appropriate semantic theme.

27. The system as in claim 26 wherein the plurality of semantic theme processors include at least one semantic theme processor selected from the group consisting of a wedding group processor, a baby group processor, a birthday party group processor, and an undersea group processor.

28. The system as in claim 26 in which the semantic theme processor is a wedding group processor and the wedding group processor includes at least one processor selected from the group consisting of a compositing processor to autonomously create pleasing composite images of a bride and a groom or wedding party members, a vignetting processor to autonomously create pleasing vignette images of the bride and groom individually or together, an album processor to autonomously create pleasing photo albums of wedding

images, and a motion image processor to autonomously create pleasing motion images of the bride and groom.

29. The system as in claim 26 in which the semantic theme processor is a baby group processor and the baby group processor includes at least one processor selected from the group consisting of a vignetting processor to autonomously create pleasing vignette images from suitable baby pictures, an album processor to autonomously create pleasing photo albums of baby images, an album processor to autonomously create pleasing photo albums of baby images in which the gender of the baby is automatically determined from image content and the album has gender-specific artwork, and a motion image processor to autonomously create pleasing motion images from baby pictures.

30. The method as in claim 26 in which the semantic theme processor is a birthday group processor and the birthday group processor includes at least one vignetting processor to autonomously create pleasing vignette images from suitable birthday person pictures, an album processor to autonomously create pleasing photo albums of birthday images, and a motion image processor to autonomously create pleasing motion images from birthday pictures.

31. The method as in claim 26 in which the semantic theme processor is an undersea group processor and the undersea group processor includes a processor to autonomously create images optimally rendered so as to produce more vivid colors.

2006070 "50924007